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RESEARCH ARTICLE

ROLE OF DYNAMIC DUPLEX IN THORACIC OUTLET SYNDROME.

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Abstract

Introduction: Outcome of surgery in non-specific thoracic outlet syndrome (TOS) is variable.Duplex imaging of the subclavian artery during Adson's maneuver may help predict outcome.

Patients and methods: A retrospective study of 32 cases of non-specific TOS who had preoperativeduplex imaging of the subclavian artery during Adson's maneuver was done and theiroutcomes following surgical decompression of the thoracic outlet studied.

Results: Of the sixteen cases with a positive Adson's test, fourteen (87.5%) had a complete response of symptoms following surgery while in the sixteen cases with a negative test, only eight (50%) had afavorable response to surgery.

Conclusion: Duplex scanning of the thoracic outlet during Adson's maneuver may help predict outcome of thoracic outlet decompression surgery in cases of non-specific TOS.

Introduction:-

Disputed or non-specific neurogenic thoracic outlet syndrome (TOS) remains one of the more controversial topics in the field of vascular surgery. There are no definite criteria to make the diagnosis, and the outcome following surgery is also variable. Identifying those patients who would potentially benefit from surgery would allow surgical decompression to be used more selectively, resulting in better results. This retrospective study was done to see if duplex imaging in stress positions correlated with outcome after surgical decompression of the thoracic outlet in patients with non-specific TOS.

Patients and methods:-

Seventy four cases of TOS underwent surgical decompression over the last 10 years in this teaching hospital. Out of these, 34 were neurogenic, eight were vascular and 32 were cases of non-specific TOS. These 21 cases of non-specific TOS were included in the study. Charts were reviewed for details on duplex imaging in these patients. The 32 cases who had duplex imaging in stress positions were studied. Arterial flow in the subclavian artery and axillary artery were studied in normal position and during an Adson's maneuver. Adson's maneuver was performed by instructing the patient to inspire maximally, hold his or her breath, extend the neck fully and turn towards the affected side. A positive result was defined as either doubling of the peak systolic velocity (PSV) or dampening or complete cessation of flow in the artery. All cases underwent excision of the first rib. Outcomes after surgery were

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classified as complete response, partial response and no response on the basis of relief of symptoms 1 year after the procedure.

Table 1:-Results of Doppler Adson's maneuver. PSV peak systolic velocity

Result	Number (percentage)
Increase in PSV	4 (12.5%)
Dampening of flow	10 (31.25%)
Cessation of flow	2 (6.25%)
No response	16 (50%)

Table 2:-Results of surgical decompression in positive group

Response at 1year	Number (percentage)
Complete response of symptoms	14(87.5%)
Partial response of symptoms	2 (12.5%)
No response	0

Results:-

Out of the 32 cases, sixteen (50%) had a positive Doppler Adson's test (Table 1). Fourteen (87.5%) of these had a complete response to surgical decompression (Table 2). Among the other sixteen who had a negative Doppler Adson's test, only eight (50%) had a complete response to surgical decompression. The other eight had either no response or a partial response (Table 3)

Table 3:-Results of surgical decompression in negative group

Response at 1year	Number (percentage)
Complete response of symptoms	8(50%)
Partial response of symptoms	4(25%)
No response	4(25%)

Discussion:-

Color Doppler sonography in stress positions has been identified as a useful tool in the diagnosis of TOS.(1,2) However, the high prevalence of asymptomatic arterial compression at the thoracic outlet in normal individuals has cast doubts on the value of this test.(3) Among the various provocative maneuvers described, hyperabduction beyond 90, abduction-external rotation and Roo's test have been found to have a high degree of positivity in healthy individuals.(4)However, Adson's maneuver has a 0% positive response on Doppler among healthy individuals, making it a more specific test for TOS.4 Non-specific neurogenic TOS has been variously described as ''over diagnosed'' 5 and ''overlooked, underrated and misdiagnosed''. (6) This is because of the lack of uniform criteria to diagnose the condition. Although surgical decompression of the thoracic outlet by transaxillary excision of the first rib is a relatively safe procedure,(7) it is not without morbidity, and in cases of non-specific TOS, it does not ensure amelioration of symptoms. In this scenario, colour Doppler imaging of the subclavian artery at the thoracic outlet during an Adson's maneuver may help predict the subset of patients more likely to benefit from surgical decompression. As patients with non-specific TOS usually have vague neurological symptoms, it is not clear whether this subset who respond to decompression have an element of arterial compression contributing to their symptoms. It is more likely that this test merely picks out the individuals who have a narrow thoracic outlet and hence are more likely to benefit from surgery. In conclusion, ''direct duplex scanning of the subclavian artery in neutral and provocative postures is reasonably predictive of successful outcome of thoracic outlet decompression surgery''. (8)

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